UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER			

BIOLOGY **0610/21**

Paper 2 Core **October/November 2013**

1 hour 15 minutes

Candidates answer on the Question Paper.

No Additional Materials are required.

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on all the work you hand in.
Write in dark blue or black pen.
You may use a pencil for any diagrams or graphs.
Do not use staples, paper clips, highlighters, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.

Electronic calculators may be used.
You may lose marks if you do not show your working or if you do not use appropriate units.

At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.

This document consists of **19** printed pages and **1** blank page.

For Examiner's Use

1 Fig. 1.1 shows a woodlouse.

Fig. 1.1

The woodlouse is a crustacean, one of the four groups of arthropod.

It is a herbivore that lives on land and eats decaying plant materials.

It breathes with gills that must be kept moist.

(a) Name **two** other groups of arthropod.

For each group state one feature found **only** in animals of that group.

1 group .....

feature .....

2 group .....

feature ..... [4]

(b) Some students were sent to find woodlice for an investigation.

Suggest **and** explain **two** reasons why populations of woodlice are usually found under stones, decaying wood and leaves.

1 reason .....

explanation .....

.....

2 reason .....

explanation .....

..... [4]

[Total: 8]

2 Inspired air has a different composition to expired air.

Complete Table 2.1 to show how inspired air is different from expired air.

Table 2.1

substance	how inspired air is different from expired air
carbon dioxide	
dust particles	
oxygen	
water vapour	

[4]

[Total: 4]

3 Fig. 3.1 shows a poster that a student made for a biology lesson.

For Examiner's Use

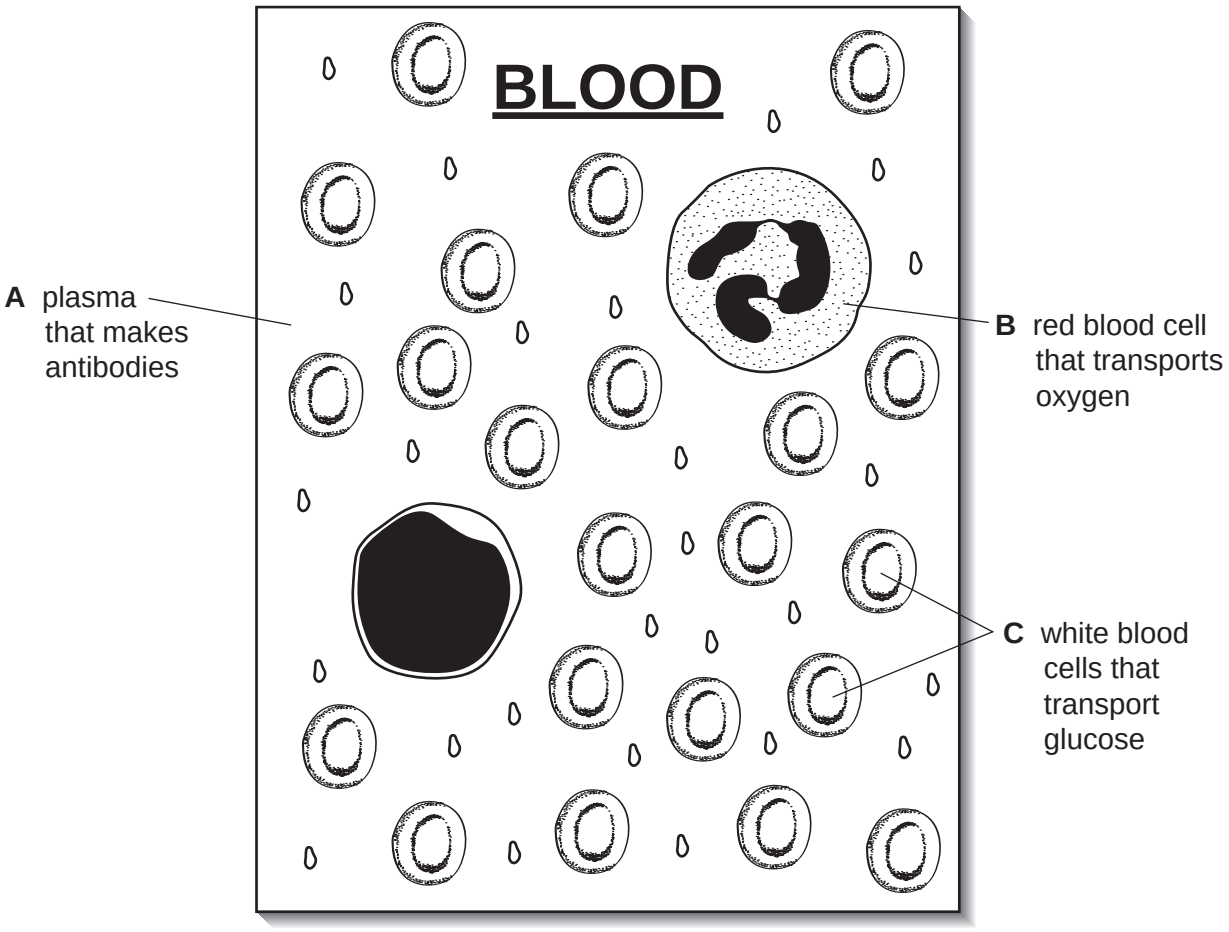

Fig. 3.1

The teacher told the class that the student had made a number of mistakes.

(a) For each of the **three** labels, correct the mistakes by giving the name and function of each component.

A name .....

function .....

.....

B name .....

function .....

.....

C name .....

function .....

..... [6]

(b) Name **one** other component of the blood that is **not** labelled on the poster.

State its function.

component .....

function .....

..... [2]

[Total: 8]

For Examiner's Use

4 **(a)** Table 4.1 shows some of the top ten causes of death in parts of the world during 2010.

Table 4.1

cause of death	percentage of the deaths of adult males	percentage of the deaths of adult females
cancer (lung, alimentary canal, breast, prostate and others)	17	12
coronary heart disease	7	14
stroke (blood clot in brain)	17	10

Fig. 4.1 shows the data for the adult males.

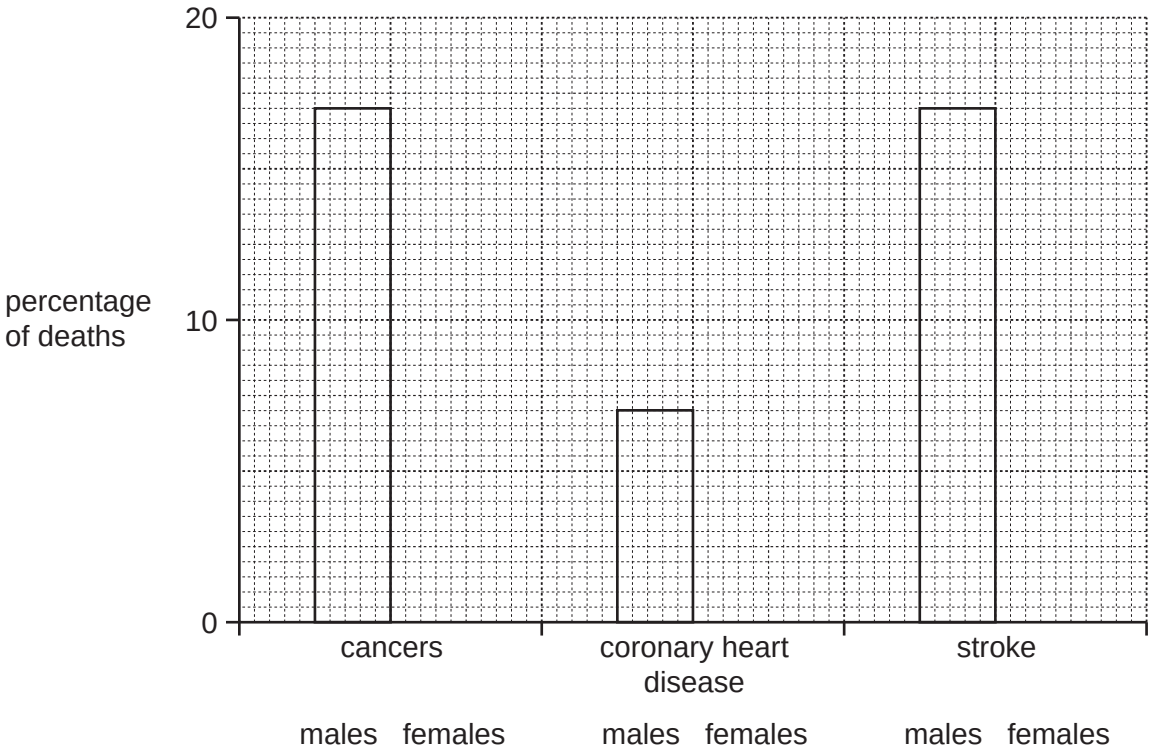

Fig. 4.1

(i) Draw the bars for the adult females on Fig. 4.1. [1]

(ii) Calculate the percentage of males dying from causes other than those in Table 4.1.

Show your working.

.....% [2]

(iii) State the type of cancer, listed in Table 4.1, that occurs only in males.

..... [1]

For Examiner's Use

(b) The lifestyles of people can affect their risk of dying from some diseases.

(i) Suggest **three** actions that humans could take to lower their risk of dying from coronary heart disease.

1 .....

.....

2 .....

.....

3 .....

..... [3]

(ii) In 2010 2% of adult male deaths were due to liver disease.

Suggest **one** aspect of their life style that could have caused this.

..... [1]

[Total: 8]

5 **(a)** Wheat is a type of grass that has been grown by humans for about 9000 years. The earliest variety is called emmer.

Fig. 5.1 shows emmer wheat and a modern type of wheat.

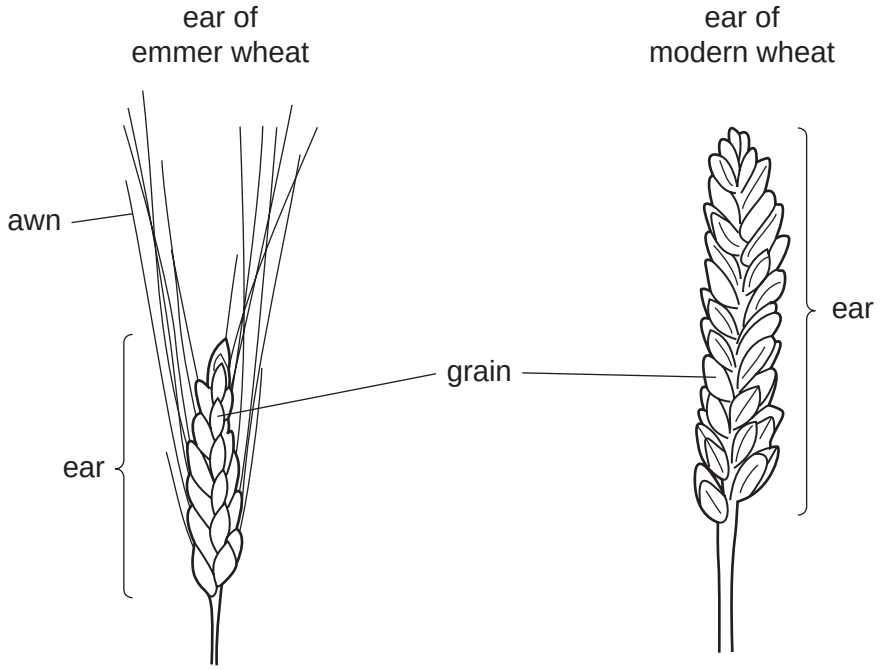

Fig. 5.1

(i) Use Fig. 5.1 to describe **two** ways in which emmer wheat is different from modern wheat.

1 .....

.....

2 .....

..... [2]

(ii) Over hundreds of years farmers improved the yield of wheat crops.

They kept grains from the highest yielding ears to grow the next crop.

Name this farming practice.

..... [1]

(b) There is evidence that emmer wheat was pollinated by pollen from other grasses.

This produced new varieties.

Fig. 5.2 shows a section through a flower of wheat.

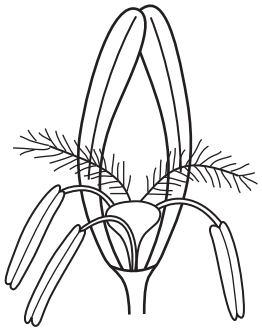

Fig. 5.2

Suggest the method of pollination in this wheat flower.

Give **two** reasons for your answer.

method .....

reasons .....

.....

.....

.....

..... [3]

For Examiner's Use

(c) 3000 years ago some farmers stored wheat in pits in the ground.

Fig. 5.3 shows a pit full of grain.

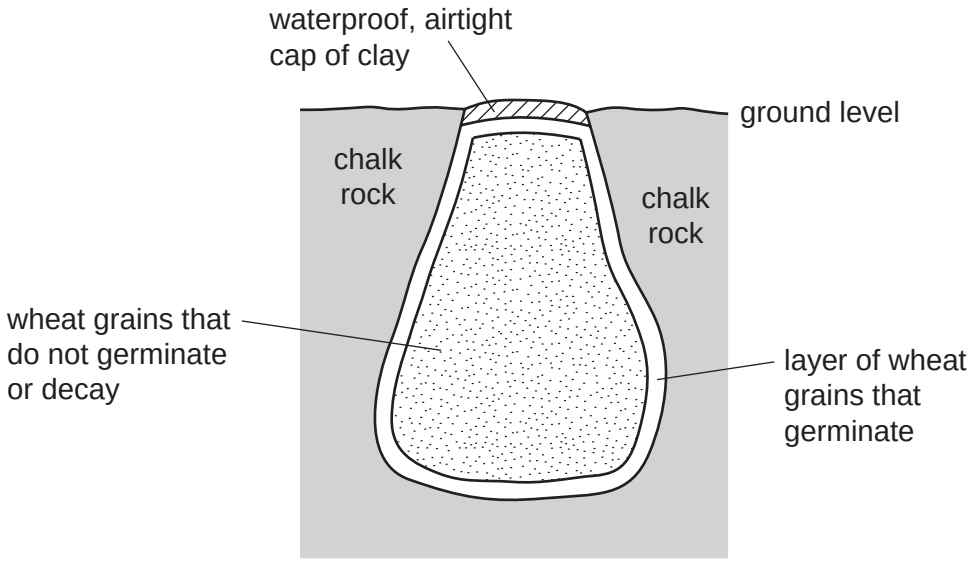

Fig. 5.3

Wheat grains near the edge of the pit germinate.

The germinating grains use up all of one gas from the air in the pit and produce a different gas.

The germinating grains also release heat that causes the temperature in the pit to rise to 80 °C.

(i) Name the chemical reaction that uses up and produces the gases.

..... [1]

(ii) Name the gas used up during this chemical reaction.

..... [1]

(iii) Name the gas released during this chemical reaction.

..... [1]

(iv) Suggest and explain **three** reasons why most of the grains in the pit did not germinate or decay.

For Examiner's Use

1 .....

.....

2 .....

.....

3 .....

..... [3]

[Total: 12]

6 Complete the sentences about the contents of a nucleus by writing the most appropriate word in each space.

For Examiner's Use

Use **only** words from the box.

alleles	chromosomes	diploid	DNA
gametes	genes	haploid	muscles

Chromosomes are long threads of ..... made up of many ..... .

Two or more alternative forms of a gene, are called .....

A .....nucleus contains a single set of unpaired ..... . These nuclei are found in ..... .

[Total: 6]

For Examiner's Use

7 **(a)** Fig. 7.1 shows a carbon cycle.

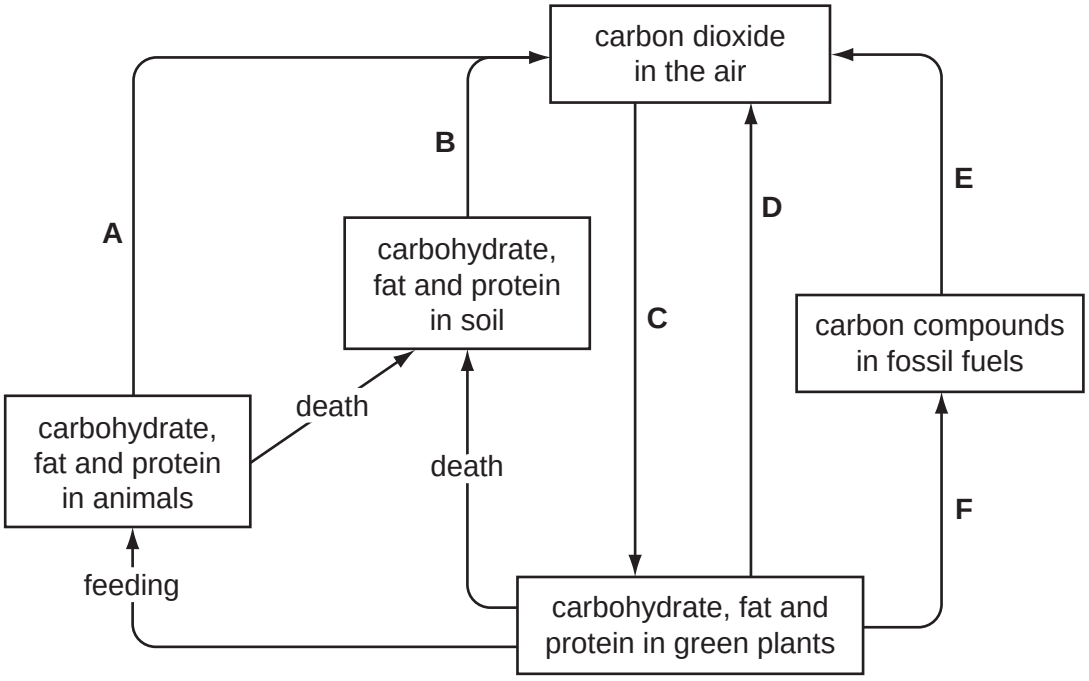

Fig. 7.1

(i) Write the letter of an arrow, **A**, **B**, **C**, **D**, **E**, or **F** as shown in Fig. 7.1, that represents each of the following processes.

combustion .....

photosynthesis .....

respiration ..... [3]

(ii) Many of the world's governments are concerned that the carbon dioxide concentration in the atmosphere keeps rising.

Explain why they are concerned about the rise in carbon dioxide concentration.

.....

.....

.....

.....

.....

.....

..... [3]

[Turn over

For Examiner's Use

(b) Gazelles are herbivores that eat grass.

Oxpecker birds feed on ticks that live on the skin of gazelles.

Ticks suck blood from the gazelles.

(i) Draw a food chain to represent these feeding relationships.

[2]

(ii) State what the arrows represent in a food chain.

..... [1]

(iii) Explain why a food chain is **not** considered to be a cycle like the carbon cycle.

.....

.....

.....

.....

.....

.....

..... [3]

[Total: 12]

For Examiner's Use

8 Throughout the world there are almost equal numbers of female and male babies born. The sex of a baby is determined by the sex chromosomes.

(a) State the sex chromosomes present in a female and a male.

Use **X** and **Y** to represent the sex chromosomes.

female .....

male ..... [2]

(b) Complete the genetic diagram to show the inheritance of sex in humans.

parent	female	male
parental chromosomes	.....	.....
gametes	○ ○	○ ○

offspring chromosomes	.....	.....	.....	.....
offspring	.....	.....	.....	.....

[3]

[Total: 5]

For Examiner's Use

9 The enzyme lactase digests lactose into simple sugars.

(a) Define the term *enzyme*.

.....

.....

.....

..... [2]

(b) Describe how you could test for the presence of reducing sugars.

State what you would observe if the result was positive.

.....

.....

.....

.....

.....

.....

..... [3]

(c) Fig. 9.1 shows the results of an investigation into the effect of pH on the activity of the enzyme lactase.

For Examiner's Use

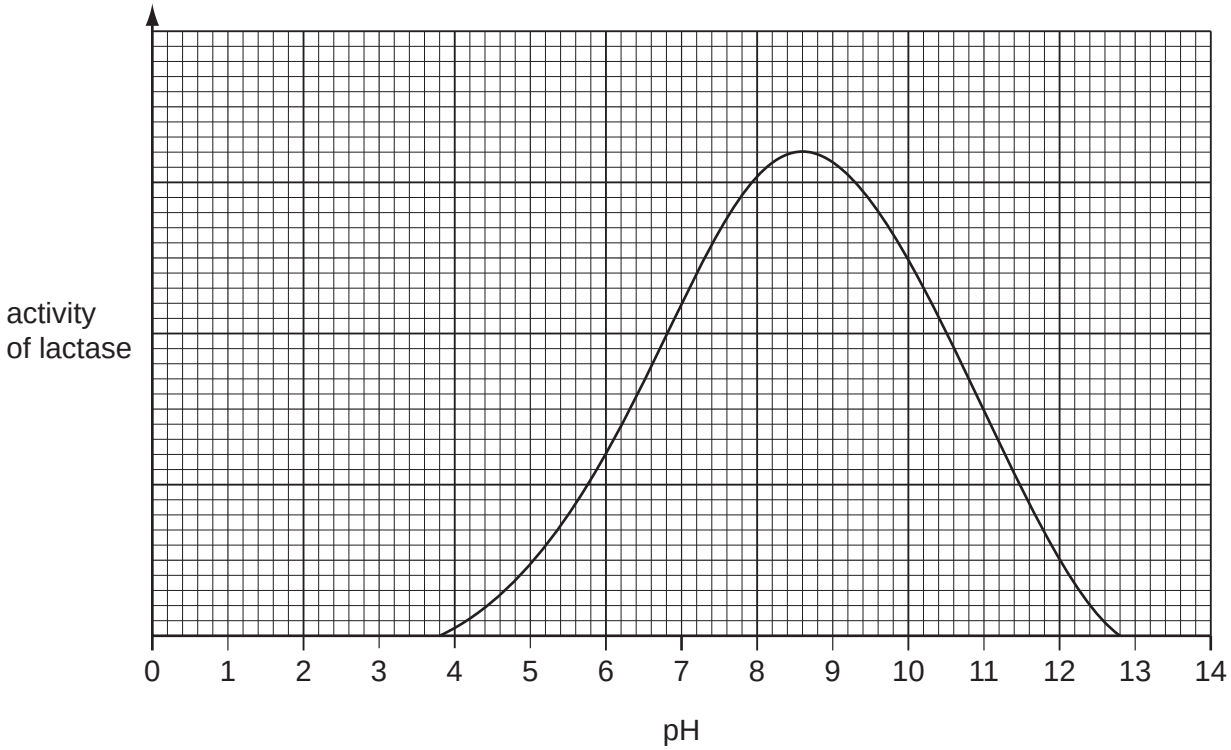

Fig. 9.1

(i) Use Fig. 9.1 to determine the optimum pH of lactase.

..... [1]

(ii) Describe the effect of the changes in pH on the activity of lactase.

.....

.....

.....

.....

.....

.....

..... [3]

(d) Enzymes are involved in chemical digestion.

Explain the role of teeth in physical digestion.

.....

.....

.....

.....

..... [2]

[Total: 11]

For Examiner's Use

For Examiner's Use

10 Photosynthesis takes place in the leaves of plants.

(a) (i) Leaves absorb light energy and this is converted into chemical energy.

State where in leaves this energy change takes place.

..... [1]

(ii) Complete the word equation for photosynthesis.

water + ... ⟶ oxygen + ... [2]

(b) Describe how water enters a plant from the soil.

.....

.....

.....

.....

.....

.....

..... [3]

[Total: 6]

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